

## PARAMETERS

```
mu=0.5; c11=10^2; c13=5; c13d=0.15;
```

```
c=1;
```

```
au0=8*c;
```

```
au1=10*c;
```

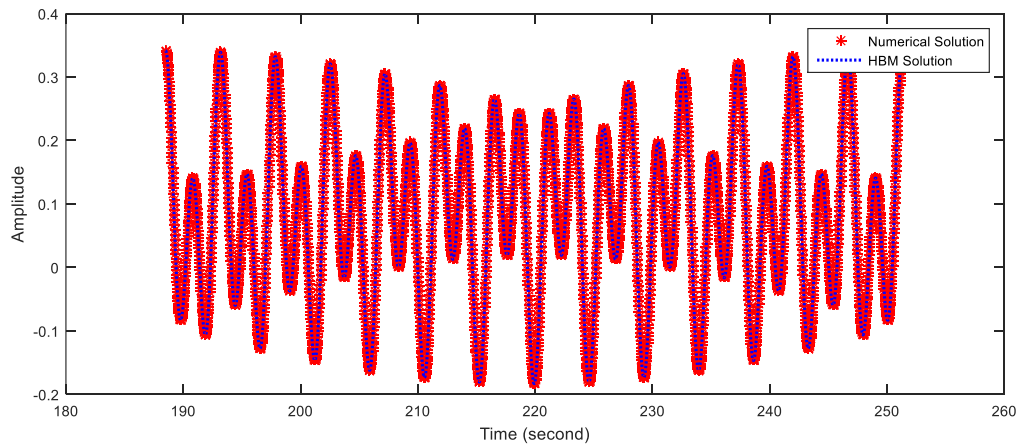
```
au2=15*c;
```

```
TEST 1-----
```

```
% input frequency
```

```
w1 = 1.3;%rad/s
```

```
w2 = 2.7;%rad/s
```



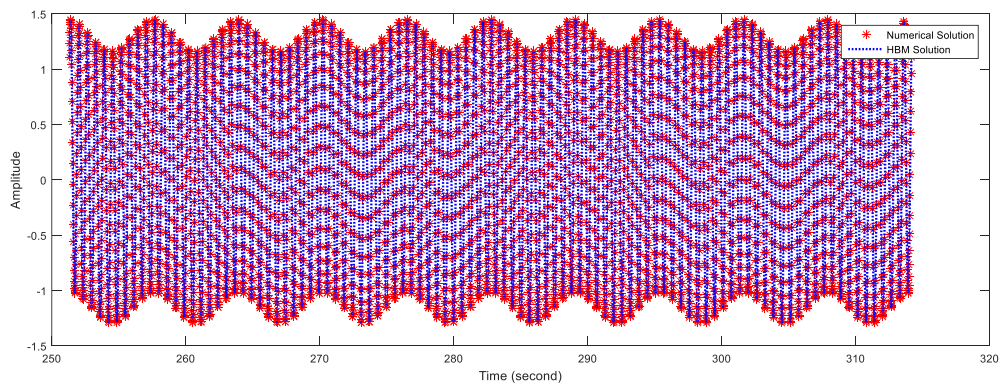
```
%TEST 2-----
```

```
%change frequency
```

```
% input frequency
```

```
w1 = 10;%rad/s
```

```
w2 = 1;%rad/s
```



```
%TEST 3-----
```

```
c=5; % chance amplitude
```

```
au0=8*c;
```

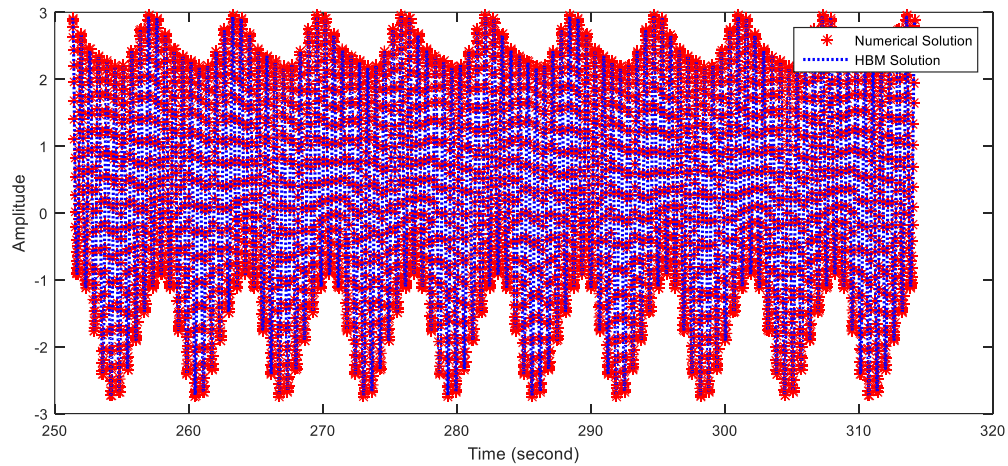
```
au1=10*c;
```

```
au2=15*c;
```

```
% input frequency
```

```
w1 = 10;%rad/s
```

```
w2 = 1;%rad/s
```



%TEST 4-----

### Command window output

```
c=5;
au0=8*c;
au1=10*c;
au2=15*c;
% input frequency
w1 = 3.2;%rad/s
w2 = 1.8;%rad/s
```

compute hbe solution:

```
costhbe =
    2.9173e-26
```

compute numerical solution:

```
mse_err =
    47.3915
mse_err =
    9.0363
mse_err =
    1.0226e-07
mse_err =
    7.0438e-12
```

Amplitudes of components:

```
constant :0.37613
0*w1+1*w2 :0.73122
0*w1+2*w2 :0.014166
1*w1-2*w2 :0.0083522
1*w1-1*w2 :0.018504
1*w1+0*w2 :0.51892
1*w1+1*w2 :0.023698
1*w1+2*w2 :0.014597
2*w1-2*w2 :0.001303
2*w1-1*w2 :0.0069842
2*w1+0*w2 :0.0088012
2*w1+1*w2 :0.015925
2*w1+2*w2 :0.019746
```

### Reference study:

Akgün, D., I. Çankaya, and JC Peyton Jones. "A symbolic algorithm for the automatic computation of multitone-input harmonic balance equations for nonlinear systems." *Nonlinear Dynamics* 56.1-2 (2009): 179-191.